$\Rightarrow b_n = -1 + (n-1).(n-2)$

D'où $\boxed{b_n = n^2 - 3n + 1}$

4) $a_{100} = -198$ et $b_{100} = 9701$

Donc $f^{(100)}(x) = (x^2 - 198x + 9701)e^{-x}$

EX9

1) $f(x) = e^{2x}$

$F(x) = \frac{1}{2}e^{2x}$

2) $f(x) = xe^{1+x^2}$

$F(x) = \frac{1}{2}e^{1+x^2}$

3) $f(x) = \frac{1}{\cos^2 x}e^{\tan x}$

$F(x) = e^{\tan x}$

4) $f(x) = \sin(2x)e^{\cos^2 x}$

$= 2\sin x.\cos x\ e^{\cos^2 x}$

$F(x) = -e^{\cos^2 x}$

5) $f(x) = \frac{1}{(x-1)^2}e^{\frac{1}{x-1}}$

$F(x) = -e^{\frac{1}{x-1}}$

6) $f(x) = \sqrt{e^x} = e^{\frac{1}{2}x}$

$F(x) = 2e^{\frac{1}{2}x} = 2\sqrt{e^x}$

7) $f(x) = \frac{e^{2x}}{1+e^{2x}}$

$F(x) = \frac{1}{2}\text{Ln}(1+e^{2x})$

8) $f(x) = \frac{e^{2x}-1}{1+e^{2x}} = \frac{e^{2x}}{1+e^{2x}} - \frac{1}{1+e^{2x}}$

$= \frac{e^{2x}}{1+e^{2x}} - \frac{e^{-2x}}{e^{-2x}+1}$

$F(x) = \frac{1}{2}\text{Ln}(1+e^{2x}) + \frac{1}{2}\text{Ln}(1+e^{-2x})$

$= \frac{1}{2}\text{Ln}[(e^{2x}+1)(e^{-2x}+1)]$

$F(x) = \frac{1}{2}\text{Ln}(e^{2x}+e^{-2x}+2)$

9) $f(x) = xe^{2x^2}$

$F(x) = \frac{1}{4}e^{2x^2}$

EX10

1) a) $\int_0^1 (1+e^x).dx = \left[x+e^x\right]_0^1 = e$

b) $\int_0^1 xe^{x^2}.dx = \left[\frac{1}{2}e^{x^2}\right]_0^1 = \frac{e-1}{2}$

c) $\int_0^1 \frac{e^x}{1+e^x}.dx = \left[Ln(1+e^x)\right]_0^1$

$= \text{Ln}(\frac{1+e}{2})$

d) $\int_1^2 \frac{dx}{1+e^x} = \int_1^2 \frac{e^{-x}}{1+e^{-x}}.dx$

$= \left[-Ln(1+e^{-x})\right]_1^2$

$= \text{Ln}(\frac{e^2+e}{e^2+1})$

e) $\int_1^2 \frac{1}{x}e^{Lnx}.dx = \int_1^2 .dx = 1$

f) $\int_1^2 \frac{e^{-x}}{(1+e^{-x})^2}.dx = \left[\frac{1}{1+e^{-x}}\right]_1^2$

$= \frac{e^2}{e^2+1} - \frac{e}{e+1}$

g) $\int_1^2 \frac{1}{x^2}e^{\frac{1}{x}}.dx = \left[-e^{\frac{1}{x}}\right]_1^2 = e - \sqrt{e}$

2) a) $I = \int_1^2 2xe^{-x}.dx$

$\begin{cases} v(x) = 2x & \rightarrow v'(x) = 2 \\ u'(x) = e^{-x} & \rightarrow u(x) = -e^{-x} \end{cases}$

Qarray.tn -Aqra Blech- Qarray.tn